



The mission of the Kentucky Division of Energy is to provide leadership to maximize the benefits of energy efficiency and alternate energy through...

**AWARENESS
TECHNOLOGY
DEVELOPMENT
ENERGY
PREPAREDNESS
NEW
PARTNERSHIPS
and RESOURCES.**

KENTUCKY - DIVISION OF ENERGY NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET

ORGANIZATION AND AUTHORITY

The Kentucky Division of Energy (KDOE) is a division within the Natural Resources and Environmental Protection Cabinet, Department for Natural Resources. The Kentucky Revised Statutes direct KDOE to develop and implement programs for the conservation, development and utilization of energy in a manner to meet the needs of Kentuckians while maintaining the state's economy at the highest feasible level.

KDOE is authorized to enter into agreements, administer grant programs and serve as a liaison with the federal government and other states.

The program includes:

- Central access for collection, maintenance and analysis of data and information on all forms of energy supplies, demand, efficiency and related subjects
- Formulation of a contingency plan to cope with energy emergencies
- Development and implementation of energy efficiency programs involving all sectors of the Kentucky economy
- Promotion of the use of renewable energy technologies when economically feasible, including solar energy, biomass and alternative fuels for vehicles



Below: Lt. Gov. Steve Henry, Rep. Tanya Pullin, D-South, along with representatives from American Electric Power, U.S. Department of Energy and the local community help celebrate "Learning from Light" in Greenup County.

Above: Staff representatives from U.S. EPA and U.S. DOE along with local ENERGY STAR® partners made the Kentucky State Fair ENERGY STAR exhibit a success.



PROGRAMS AND SERVICES

U.S. DEPARTMENT OF ENERGY STATE ENERGY PROGRAM

The U.S. Department of Energy (U.S. DOE) State Energy Program (SEP) provides funding to design and implement state energy efficiency and renewable energy programs. These programs are designed based on individual state economies, natural resources and local industry participation. Program results are directly linked to a large number of diverse and innovative projects in local communities within the United States and its territories.

Eighty percent of the KDOE's baseline funding is provided by U.S. DOE with the remaining balance provided through state resources. Kentucky's participation in the SEP allows KDOE to compete for SEP Special Project grants to support larger and more aggressive projects and programs. SEP projects generate approximately \$4 of investment from partners for every \$1 of U.S. DOE funding. All the programs and projects mentioned in this report have been funded by the SEP, SEP Special Project grants or a combination of these sources matched with private support.

ENERGY EFFICIENCY IN GOVERNMENT BUILDINGS

Kentucky statutes passed in 1996 supported a conservation program to reduce energy costs in government buildings with energy savings performance contracting (ESPC) being the centerpiece of this program. Legislation directs KDOE to provide technical assistance to the Finance and Administration Cabinet (FAC) to implement a program. KDOE

conducts workshops for state and local government operations as well as maintenance personnel.

To utilize opportunities offered by this program, FAC in conjunction with KDOE, formed a working group to recommend changes to existing legislation. These recommendations were approved by the 2002 General Assembly and allow state agencies to



Kentucky State Capitol

proceed with energy savings performance contracts. FAC established a Performance Contracting Team to assist state agencies. In 2002, FAC awarded over \$7 million in contracts to Western Kentucky University and Kentucky Community and Technical College System. FAC has another \$15 million ESPCs identified.

KDOE was instrumental in establishing a Kentucky Chapter of the Energy Services Coalition (ESC). ESC is a national nonprofit organization composed of a network of experts from a wide range of organizations working together at the state and local level

to increase energy efficiency and building upgrades through energy savings performance contracting. The local chapter has been an effective body to educate consumers about ESPC in the Commonwealth.

BUILDING EFFICIENCY STANDARDS

Building the High Performance Home Workshops

Over the next two years, KDOE will host nine workshops on "Building the High Performance Home." The wide-ranging program features presenters from the Southface Energy Institute, a nationally recognized organization with a 24-year history of providing training sessions on how to build better buildings. The workshops focus on the practical aspects of energy-efficient construction to increase the marketability of the homes. Attendees learn how the house works as a system, how to make a house efficient while maintaining healthy indoor air quality, and how to evaluate efficiency options from a common sense, bottom-line standpoint. Workshops started in May 2002.

Residential Construction Baseline Study-Building Codes

KDOE is conducting a comprehensive review and analysis of single-family residential construction practices in Kentucky to determine the extent to which newly constructed homes meet the state's building energy code. The project will focus on design and construction issues for houses that fall short of code requirements. It will also identify areas where builders and code enforcement officials could benefit from better instructional materials or techniques. Communities participating in the survey include northern Kentucky, Louisville, Lexington and Bowling

Green. The survey is scheduled for completion by June 2003.

Urban Redevelopment Energy Design Charrette

The Jefferson County Air Pollution Control District and KDOE are supporting a design charrette project. This pilot project will demonstrate the effectiveness of a design charrette to optimize the energy efficiency of a mixed-use or multi-family residential building or housing development in an urban redevelopment context. Relatively low electricity costs and the lack of incentives for developers, architects and builders to reduce energy costs for future building occupants have impeded the adoption of energy-efficient techniques such as integrated whole-building design in Kentucky. This project seeks to foster the wider use of energy design charrettes, groups whose members represent all interested parties, as well as integrated design, proving their efficacy and familiarizing them with metropolitan development agencies, private developers and building contractors.

Combined Heat and Power Study

Jefferson County Air Pollution Control District and KDOE are performing a market study of "combined heat and power" (CHP, also known as cogeneration). CHP generates electricity at or near its point of use and captures wasted heat for space heating, water heating, process heating and will even power an air conditioning system. Well-designed CHP systems reduce overall fuel consumption, reduce stress on the power grid and reduce air pollution while increasing power reliability. Hundreds of businesses, colleges and government facilities now

use CHP to take advantage of these benefits. Results of this survey will help to promote cost-effective voluntary actions that improve air quality.

Home Energy Rating System and Energy Efficient Mortgages

KDOE is taking actions to implement a Home Energy Ratings System (HERS) in Kentucky to



Greg Guess, KDOE, and Jeff Tiller, JTA/Southface Associates, discuss Energy Star opportunities at the Kentucky State Fair.

improve the energy efficiency of new and existing houses.

ENERGY STAR® PARTNERSHIP

In September 2001, KDOE became an Energy Star partner to promote and advise citizens on the program and the benefits of becoming energy efficient. ENERGY STAR is a voluntary program sponsored by the U.S. DOE and the U.S. EPA. This federal partnership strives to increase consumer awareness, interest and the desire for energy efficient products. U.S. DOE and U.S. EPA are promoting the use of energy efficient equipment by awarding the ENERGY STAR label

to appliances and electronic equipment that significantly exceed the minimum national efficiency standards. The label helps consumers easily identify these efficient products. KDOE's efforts are focused on building a network of partners active in Kentucky.

Kentucky State Fair Exhibit

Kentucky ENERGY STAR partners sponsored a 1500-square foot exhibit during the August 2002 Kentucky State Fair. The exhibit featured a demonstration home with ENERGY STAR labeled appliances, heating and cooling equipment, lighting, and windows. The ENERGY STAR exhibit contained four main structures: a mock wall of a home (one side is interior, the other exterior) designed to showcase various ENERGY STAR qualified products including central air conditioning, room air conditioner, windows, light fixtures, compact fluorescent light bulbs (CFLs), ceiling fan, computer, etc. A mock house frame and a section of a manufactured home were displayed to demonstrate proper insulation techniques and products. A duct blaster demonstration was also part of the display. To educate youngsters about the concepts of energy efficiency, the exhibit also featured an interactive "kid's zone."

Change A Light, Change the World Campaign

KDOE is working with the Midwest Energy Efficiency Alliance (MEEA) and participating retailer and manufacturing partners in support of the ENERGY STAR Change A Light, Change the World Campaign. During October 2002, KDOE teamed up with MEEA, Westinghouse, Ace Hardware stores and sponsors across the Midwest to help consumers save money on ENERGY STAR qualified CFLs. Participating Ace Hardware stores offered two packs of Westinghouse 15W mini-spiral

CFLs for 99 cents after a six-dollar instant rebate. Thanks to overwhelming interest, the program literally ran out of rebate dollars and product in most of the Midwest region.

INDUSTRIAL ENERGY EFFICIENCY

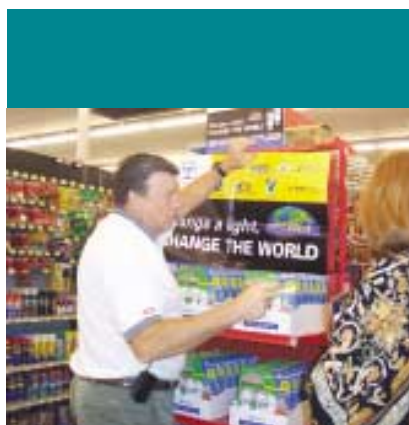
With the help of two special project grants from U.S. DOE, the Division implemented the **Industries of the Future Program** in partnership with Kentucky industries. Since its inception in 1999 with the aluminum industry, KDOE has successfully initiated more than \$15 million in industry-directed, cost-shared research and development projects involving Kentucky companies, universities and national laboratories. These projects have the potential annual energy savings of 100 trillion Btus (British thermal units) when fully implemented, which represents approximately thirteen 250-megawatt power plants. In 2000, the program expanded to investigate similar opportunities with the steel, mining, chemicals, metalcasting, agriculture, and forest products industries. Combined, these core industries employ 19 percent of Kentucky's manufacturing labor force (288,668 jobs) and represent 21 percent (\$40.5 billion) of total manufacturing value-added.

Premium Fuel Production from Mining and Timber Waste

KDOE teamed up with the University of Kentucky, coal companies and timber companies to research a premium fuel developed from the waste materials created from the production of coal and lumber. The close proximity of the two industries within the state minimizes transportation costs. In fact, a lumber operator and a coal mining company with adjacent

properties are two of the cooperating partners in the project. The Kentucky Forest Industries Association and an energy producer will also provide technical advice during the two-year project. This project is supported by a U.S. DOE grant of \$502,000.

ENERGY EDUCATION



Lexington ACE Hardware owner Bob Noren worked with Westinghouse and MEEA to promote the Energy Star "Change a Light" campaign.

National Energy Education Development Project

KDOE partners with the Kentucky affiliate of the **National Energy Education Development** (Kentucky NEED) Project for its energy education activities in primary and secondary school classrooms. KDOE is a sponsor along with the Kentucky Coal Council, American Electric Power, Cinergy and the Kentucky Oil and Gas Association of the 2002 Kentucky NEED Summer Energy Conference. This conference allowed 24 educators to visit various energy facilities and installations in Eastern Kentucky. The educators gained first-hand experience with

the energy industry and earned three hours of graduate credit from Northern Kentucky University. The conference will be hosted in western Kentucky for the 2003 summer.

Sponsors of Kentucky NEED also support workshops during the school year. This school season (2002-03), KDOE is helping to support 20 Kentucky NEED workshops at schools throughout the Commonwealth.

Energy Smart Schools

The **Energy Smart Schools Program**, conducted by KDOE, focuses on marketing to school administrators, facilities managers and educators the availability of a broad spectrum of energy programs that address both school facilities and school curricula. The Kentucky Board of Education is supportive of this KDOE initiative. In December 2002, school administrators, architects and facilities managers from Kentucky traveled to North Carolina and visited Energy Smart Schools and high performance schools. For more information see "Rebuild America" on page 5.

Learning from Light

American Electric Power, The Foundation for Environmental Education, Kentucky NEED Project and KDOE are partnering to install photovoltaic (PV) systems (i.e., solar electric systems) at ten schools across Kentucky in order to stimulate the creation of a community of solar schools. The PV systems will meet the requirements for certification by U.S. DOE in accordance with its Million Solar Roofs and EnergySmart Schools programs. Schools electing to incorporate new solar energy generation into their energy mix will also receive training to include units of study about solar energy in

their classroom curricula.

PV systems selected for installation, including training and classroom curriculum, are valued at over \$10,000 per installation. Schools electing to participate will cover only the cost of the PV system installation that ranges from \$1,500 to \$5,000 per installation depending on the level of volunteer or in-house support. All PV system installations are targeted for completion by May 31, 2004.

REBUILD AMERICA

KDOE was selected for funding under U.S.DOE's **Rebuild America Program** to promote energy-efficient retrofits in commercial, institutional and multifamily residential buildings. KDOE is working with community groups in three rural Kentucky counties to incorporate energy efficiency into their plans for community development.

In 2002, the Rebuild Kentucky project established new partnerships to market and implement an Energy Smart Schools program in six northern Kentucky counties.

The program addresses:

- building energy efficiency improvements through retrofits financed through energy savings performance contracts and improved new construction
- school transportation practices
- education programs
- procurement practices
- linkages between school facilities and activities within the surrounding community

Successful elements of the Energy Smart Schools program will be marketed to other schools statewide. Successful building

retrofit, operation and maintenance, procurement and other building efficiency program elements will be marketed to the broader building community including municipalities, universities, hospitals and commercial buildings in the six-county area and later, statewide. Principal partners in the program include the KDOE, Kentucky NEED, Energy Services Coalition



Students along with AEP's contractor install a photovoltaic system at Paul G. Blazer High School in Ashland, Ky.

(ESC), Union Light, Heat and Power and the Kentucky Department of Education.

FEDERAL ENERGY MANAGEMENT PROGRAM

The Kentucky Pollution Prevention Center (KPPC) and KDOE are partnering to bring the Commonwealth energy efficiency workshops for federal facilities and industries. Facility managers interested in learning about cost-saving energy opportunities are invited to attend. In September, workshops were held in Lexington and Louisville. Starting in February 2003, there will also be workshops in Bowling Green and Louisville.

KPPC has also developed a walk-through audit capability that is available at no charge to facility managers.

TRANSPORTATION SECTOR

Alternative Fuels for Transportation

KDOE has administered eight U.S. DOE special project grants to help Kentucky businesses and agencies convert to the use of alternative vehicle fuels such as compressed natural gas (CNG) and ethanol (E85). KDOE helped in the establishment of two Clean Cities Partnerships, Louisville/Central Kentucky and Cincinnati/Northern Kentucky. Kentucky Clean Fuels Coalition (KCFC), in conjunction with KDOE, is supporting a Propane Vehicles in State Parks Project.

Biodiesel Workshop

KDOE, in conjunction with the KCFC, the Ohio, Kentucky, Indiana Regional Governments (OKI) and U.S. DOE, sponsored a Biodiesel Workshop in April 2002 in northern Kentucky in conjunction with National Alternative Fuel Vehicle Odyssey Day.

Biodiesel Fleet Demonstration Project

KDOE is supporting a new alternative fuels program administered by the KCFC. Six entities, including five school districts, will receive funds totaling more than \$38,000 to replace conventional diesel fuel with up to 20 percent of biodiesel blends in school buses and medium duty and heavy duty off and on road diesel equipment. The program will replace approximately 45,000 gallons of standard diesel with biodiesel. The following will receive grant funding for biodiesel

usage:

- East Kentucky Power Cooperative, Winchester
- McLean County Schools, Calhoun
- Campbell County Schools, Alexandria
- Marshall County Schools, Benton
- Kenton County Schools, Independence
- Murray State University, Murray

Ethanol Workshop

KDOE, Kentucky Corn Growers Association, Kentucky Farm Bureau, Kentucky Clean Fuels Coalition and U.S. DOE are hosting a U.S. DOE Ethanol Workshop in February 2003. U.S. DOE supports these workshops as a grassroots program to establish the foundation for the long-term goal of having a biomass ethanol plant in every state in the country. Recognizing that the path to such a tremendous goal requires working with the existing and growing industry, partners work hand-in-hand with the grain ethanol industry.

Mammoth Cave Shuttle Buses

A special project grant from U.S. DOE will provide funds to convert six shuttle buses at Mammoth Cave National Park from gasoline to propane. Annually, these buses transport over 400,000 visitors. The National Propane Education and Research Council will provide refueling infrastructure support for the buses.

BIOENERGY

Biomass Heated Chicken Houses

Rural Innovations Inc., Utica, Kentucky, and KDOE have initiated a project to demonstrate the economic viability and benefits of a new hot water radiator design utilizing readily available biomass fuel, i.e., sawdust from nearby sawmills, corn stover, or rice straw. The installation of this



Murray State University converted its transportation fleet to biodiesel.

environmentally sound boiler system could demonstrate cost savings from using biomass fuels, as well as the flexibility of using a variety of fuels interchangeably as availability and relative costs dictate. The objectives are to secure the identified sources of biomass fuels; identify which of the 46 member farms will install the biomass boiler and radiator system; use it during the heating season, and collect data for comparison with heating costs prior to installation of the system. An economic assessment will be performed and included in the final technical report.

Manipulation of Product Formation by a Thermophilic Host Microorganism

KDOE is collaborating with Oak Ridge National Laboratory, University of Kentucky and Alltech in Nicholasville, Kentucky, in a \$50,000 ethanol production research project. Ethanol production now occurs in a two-step process, one at low temperature and one at a higher temperature. Combining these into a single step, could speed up the process and be made more efficient. The approach is to select one or more species of bacteria with the ability to thrive at relatively high temperatures, with oxygen and ethanol present, and then use genetic engineering to enable it to produce more ethanol instead of competing metabolic products. Several promising species of bacteria have been isolated and testing has started.

Wind Energy Project

East Kentucky Power Cooperative Inc. (EKPC) and KDOE are working together to explore wind energy opportunities in the Commonwealth. The wind power potential in Kentucky may be significantly greater than the national wind resource maps would indicate and may offer EKPC a "green power" option that may appeal to their distribution cooperatives and a segment of their retail customers. A recent study in Kentucky to identify potential wind harvesting opportunities, including the design and construction of a wind measurement system, is being finalized.

Federal Farm Bill – Title IX Energy

A partnership consisting of the Kentucky Farm Bureau, Kentucky Soybean Association, and Kentucky Clean Fuels Coalition are

working with KDOE to determine opportunities for Kentucky based on language contained in Title IX of the 2002 Farm Bill. Funded sections in the bill can support biodiesel education grant and loan opportunities for farmers and rural small businesses to purchase renewable energy and energy efficient equipment. Biomass research and development are also included. Currently, the U.S. Department of Agriculture is working with U.S. DOE to establish regulations and policy guidelines for use of these funds. The coalition will be expanded to ensure that all rural communities have an opportunity to learn about and participate in these programs.

ENERGY EMERGENCY PLANNING

Energy supply problems continue to be a concern during colder than normal winters and extreme weather conditions such as ice storms or severe snowfalls. KDOE has a role within state government for promoting energy-related support activities during periods of emergency. KDOE maintains an Energy Emergency Standard Operating Procedure manual and has updated the energy support annex to the Kentucky Emergency Operations Plan.

ENERGY POLICY DEVELOPMENT

Included within this program element are activities that contribute to the coordination and development of energy policy for the state, region and nation. KDOE serves on the Governor's Energy Policy Advisory Board and Energy Efficiency and Renewable Energy Subcommittee.

UTILITY RESTRUCTURING AND DEMAND-SIDE MANAGEMENT PROGRAM ACTIVITIES

For the past several years, KDOE has been an active participant in demand-side management collaborative efforts involving three of the state's investor-owned electric utilities: LG&E, Union Light, Heat & Power (Cinergy),



EPA Administrator Christie Todd Whitman promotes ENERGY STAR activities in Louisville.

and American Electric Power. KDOE has proposed that all five Kentucky jurisdictional utilities include more energy-efficiency and distributed generation programs in their integrated resource plans.

KDOE has participated in conferences and informal hearings and serves on a legislative task force related to utility restructuring with the Kentucky Public Service Commission. Opportunities discussed identified public benefit programs such as energy efficiency, renewable energy, research and development and low-income fuel subsidies as well

as weatherization services to ensure universal quality service and consumer protection.

KENTUCKY ENERGY DATABASE DEVELOPMENT

Adequate information on the supply, distribution and consumption of energy in Kentucky is a prerequisite to effective emergency energy management and to the development of prudent energy programs and energy policy. KDOE continues to assemble, organize and analyze data from various federal, state and private sources.

KDOE administers the State Heating Oil and Propane Program (SHOPP) in Kentucky, which consists of gathering price information from selected firms during the winter months as part of the monitoring efforts of the Energy Information Agency (EIA) in U.S. DOE.

ENERGY PARTNERSHIPS

KDOE seeks alliances with other agencies and organizations and solicits grants from outside sources to help leverage available resources.

Southern States Energy Board

The **Southern States Energy Board (SSEB)** is an interstate compact comprising 18 states and territories that work on energy-related issues important to the region.

National Association of State Energy Officials

KDOE is a member of the **National Association of State Energy Officials** and has taken an active role in its programs. The work focuses on current energy issues and policies at the federal level that affect states, including state energy office funding.

Kentucky Affiliate of the National Energy Education Development (NEED) Project

The NEED Project is dedicated to comprehensive, hands-on energy education. Students are presented with objective scientific explanations for energy in society. Materials and activities promote an understanding of the economic and environmental trade-offs of energy consumption and production.

Kentucky Clean Fuels Coalition

KDOE works closely with Kentucky Clean Fuels Coalition, a nonprofit organization that promotes alternative fuels, vehicles and refueling infrastructure throughout the Commonwealth.

Kentucky Energy Service Coalition

The Kentucky Chapter of the Energy Service Coalition is a nonprofit organization composed of a network of experts from a wide range of organizations working together at the state and local level to increase energy efficiency and building upgrades through energy savings performance contracting.

Midwest Energy Efficiency Alliance

The Midwest Energy Efficiency Alliance (MEEA) is a regional network of organizations collaborating to promote energy efficiency. The vision of MEEA is to be a leader in raising and sustaining the level of energy efficiency in the Midwest region.

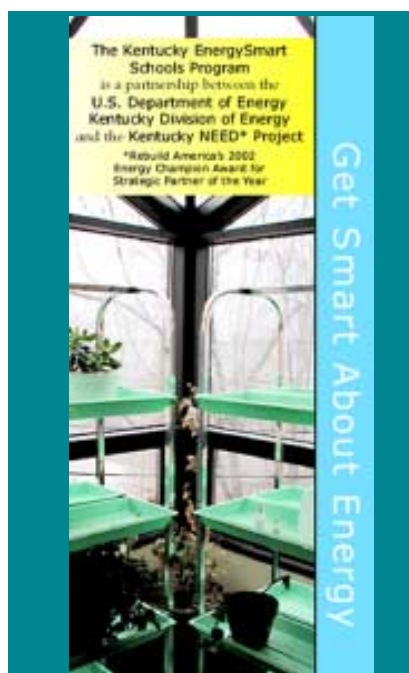
GRANT OPPORTUNITIES

KDOE can help partners obtain grant funding from a variety of sources that include, but are not limited to, the State Energy Program (SEP), SEP special projects, U.S. DOE Atlanta

Regional Office Omnibus projects and U.S. DOE Golden Field Office solicitations. Each funding opportunity has specific requirements and not all grants require a match.

STAFF

KDOE staff includes a director, seven program managers and two administrative assistants.



PUBLIC EDUCATION AND AWARENESS

Web Site

KDOE maintains an Internet Web site to support its education and awareness efforts. The home page can be found at www.energy.ky.gov.

Energy Publications

KDOE maintains information on a range of energy-related subjects directed toward all end-use sectors in Kentucky. This enables the KDOE to supply energy efficiency and renewable energy information to the general public

and to conduct energy education activities. KDOE publishes a statewide newsletter, *Kentucky Energy Watch*, a weekly update of energy prices and issues to help state leaders assess energy trends throughout the year. KDOE also helps Kentuckians locate and obtain federal energy efficiency and renewable energy publications.

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